TMDL Implementation Plan for the James River and Selected Tributaries in the Richmond Area

November 16, 2010

A Joint Effort

- City of Richmond
- Powhatan, Henrico and Chesterfield Counties
- Virginia Department of Conservation and Recreation
- Virginia Department of Environmental Quality

Why are we here today?

- Fecal Bacteria in James River and selected tributaries in the Richmond area.
  - What's Fecal Bacteria?
    - Bacteria associated with feces from warm blooded animals (fecal coliform, *E. coli*)
  - Why should we care?
    - Pathogens (including some strains of *E. coli)*
    - Parasites
  - Water Quality Standard
    - Swimming & Fishing Use
    - Instantaneous: 235 cfu/100 ml *E. coli*
    - Monthly Geometric Mean: 126 cfu/100 ml *E. coli*

TMDL Process

TMDL Implementation Plan

Document that details actions or strategies that will be undertaken to achieve load reductions as defined by the TMDL study.

Scope of Work

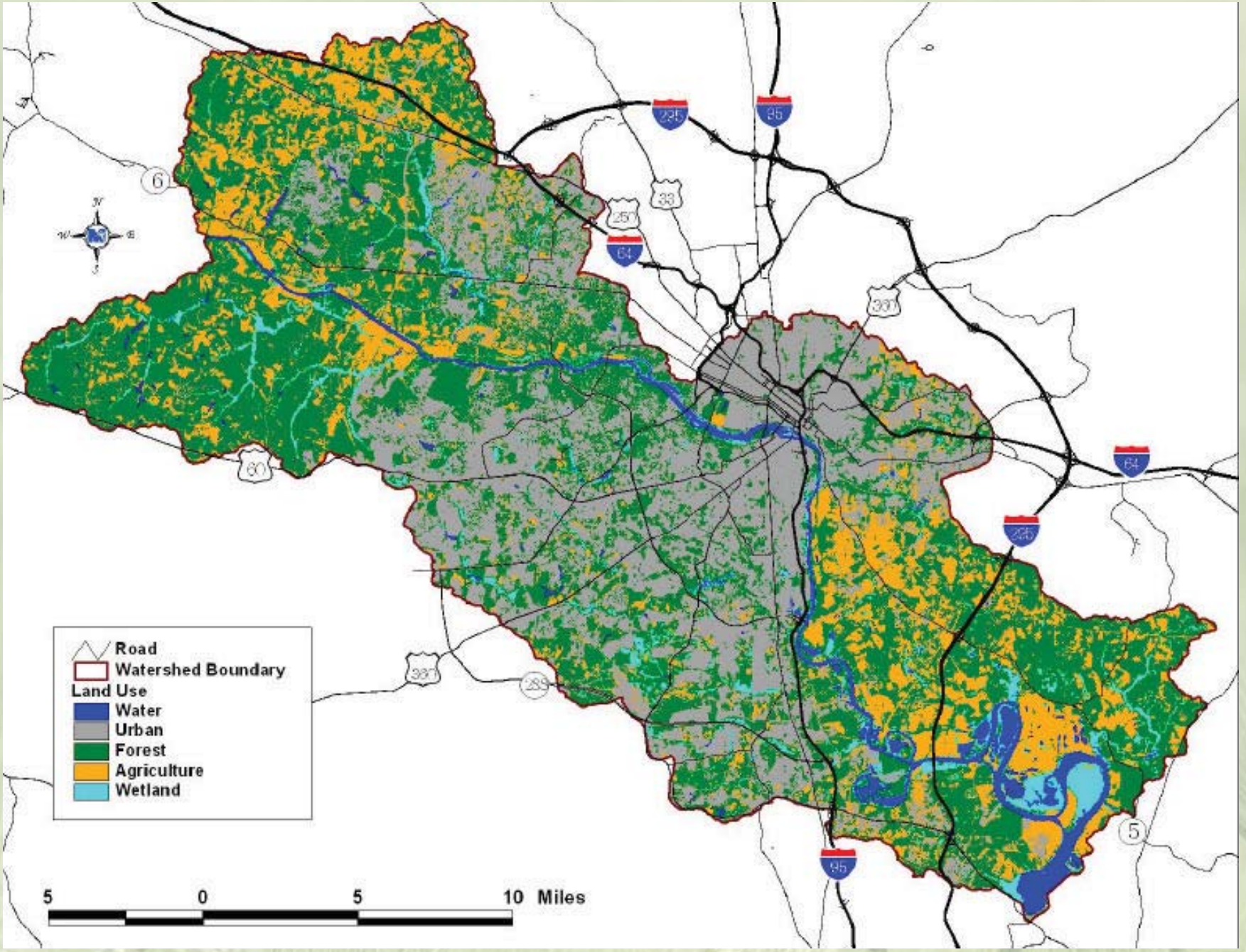
- ✓ ***Develop TMDLs in the Richmond area***
- ○ ***Develop an Implementation Plan for the James River and Selected Tributaries in the Richmond Area***
- ○ ***Incorporate Green Technologies***

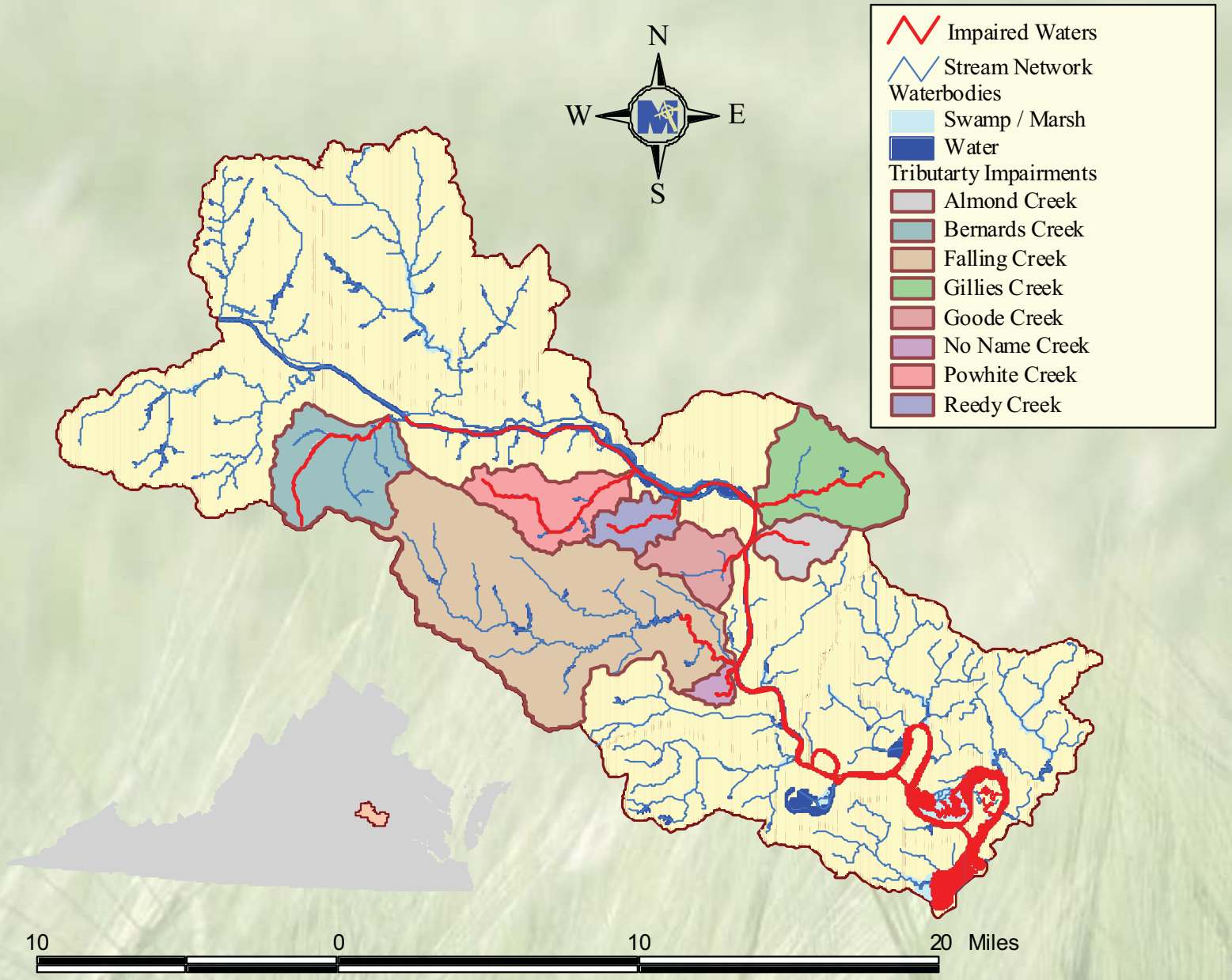
- James River (riverine)
  - Boulevard Br. to Mayos Br.
- James River (tidal)
  - Mayos Br. to Appomattox River
- Almond Creek
  - Headwaters to James River
- Bernards Creek
  - Headwaters to James R. (mainstem)
- Falling Creek
  - Reservoir Dam to James River
- Gillie Creek
  - Headwaters to James River
- Goode Creek
  - Broad Rock Creek to James R.

Scope of Work (cont.)

- ✓ ***Develop TMDLs in the Richmond area***
- ○ ***Develop an Implementation Plan for the James River and Selected Tributaries in the Richmond Area***
- ○ ***Incorporate Green Technologies***

- No Name Creek
  - X-Trib to James River
- Powhite Creek
  - Headwaters to James River
- Reedy Creek
  - Headwaters to James River


Road
Watershed Boundary
Land Use
Water
Urban
Forest
Agriculture
Wetland
5 0 5 10 Miles


N
W
E
S
Impaired Waters
Stream Network
Waterbodies
Swamp / Marsh
Water
Tributarty Impairments
Almond Creek
Bernards Creek
Falling Creek
Gillies Creek
Goode Creek
No Name Creek
Powhite Creek
Reedy Creek
10
0
10
20 Miles

Bacteria (%) Reduction Goals

Impaired Segment	Livestock Direct	Agricultural	Straight Pipes	Residential	CSO	Wildlife Land Based
Almond Creek	91	100	100	85	Alt. E + 52	0
Bernards Creek	99	48	100	71	NA	0
Falling Creek	0	0	100	13	NA	0
Gillie Creek	0	0	100	93	Alt. E + 91	0
Goode Creek	0	0	100	90	NA	0
No Name Creek	0	0	100	94.5	NA	0
Powhite Creek	40	0	100	86	NA	0
Reedy Creek	0	0	100	0	NA	0
James River (riverine)	91	99	100	99	Alt. E	62
James River (tidal)	0	0	100	0	Alt. E	0

No Reductions from direct wildlife sources needed.

Components of an Implementation Plan

- Review of TMDL
- Corrective Actions
  - BMPs, educational programs, regulatory authority, incentives
- Cost/Benefit Analysis
- Measurable Goals
- Timeline to Achieve Water Quality Objectives
  - Includes monitoring plan to assess progress
- Public Participation

Corrective Actions

- Assess needs
  - TMDL allocations
  - Identify Corrective Actions (existing/potential)
  - Spatial Analysis
- Define constraints
  - Staffing, financial, technical, social …

Corrective Actions

"Standard Toolbox"

- Livestock Fencing
- Pasture Management
- Loafing Lot Management
- Manure Management
- Septic System Repair/Installation
- Pet Sanitation
- Composting
- Retention/Detention Ponds

"Outside the Box"

- Bioretention Basins
- Rain Gardens
- Vegetated Swales
- Porous Pavement
- Subsurface Gravel Wetland
- Tree Box Filter
- Green Roofs
- Rain Barrels

Bioretention Basins

- Collects parking lot run-off
- Reduces stormwater peak flow by detention
- Reduces stormwater volume by infiltration
- Water quality benefits

Rain Gardens

- Diverts stormwater to garden instead of sewer
- Reduces stormwater volume by infiltration

Tree Boxes

- Utilizes stormwater for plant growth
- Reduces stormwater peak flow by detention
- Water quality benefits

Porous Pavement

- Reduce run-off by infiltration
- Keeps stormwater out of sewers

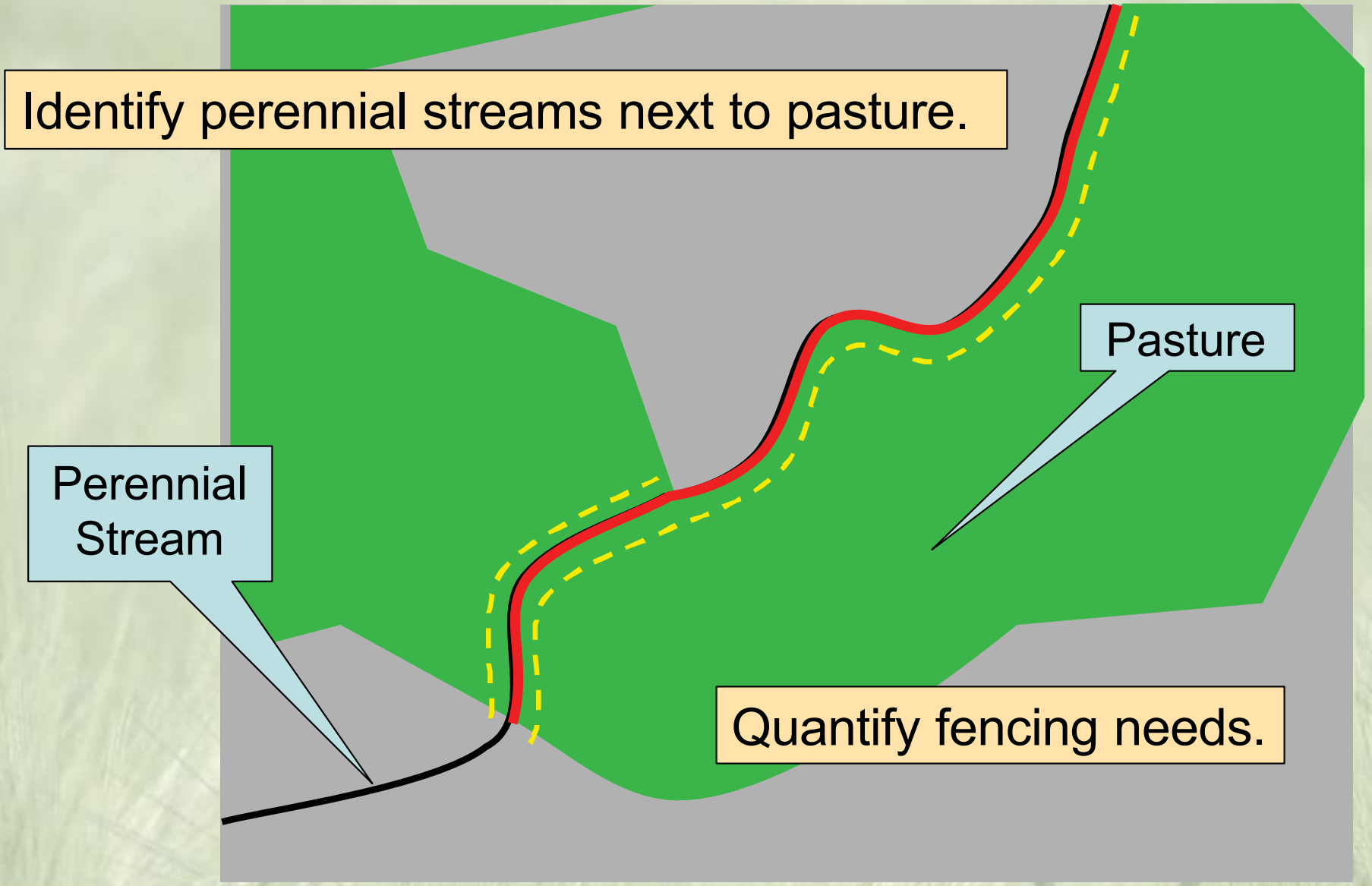
Greenroofs

- Intercepts water that would otherwise end up in sewers
- Reduces stormwater peak flow by detention
- Reduces stormwater volume by utilizing water for plant growth

Rain Barrels

- Catch stormwater
- Use it for irrigation
- Keeps stormwater out of sewers

Estimating Fencing Needs



Cost/Benefit Analysis

- Assess cost for implementation
- Evaluate environmental benefit through modeling
- Compare Cost-Effectiveness
- Identify/Evaluate economic benefits of Implementation
- Identify funding sources

Example Cost/Benefit Analysis

Control Measure	Total Cost	Reductions in Fecal Violations	Cost/Benefit
	($)	(%)	($/%)
Stream Fencing	$150,000	10%	$15,000
Street Sweeping	$30,000	1%	$30,000
Green Roofs	$3,000,000	13%	$230,769

Example

Measurable Goals/Timeline

- Phased approach (Targeting)
  - Bang for the buck
  - Spatial Analysis/Modeling
- Implementation milestones – Stakeholders
- Interim water quality milestones – Modeling
- 20 year timeframe to meet water quality standard

Example Timeline

Public Participation

- Public Meetings
  - Informational
  - Solicit public participation
  - Provide a forum for public comment
- Working Groups
  - Address “community” issues/concerns
- Steering Committee
  - Direct the overall process
  - Review output from working groups
  - Review future implementation

Local Issues

- Coordination with other plans
  - Long Term Control Plan
  - CSO and MS4
  - Bay TMDL
- Cost-Benefit
  - Reduce Stormwater Contribution

Steering Committee

- **Includes:**
  - Agencies: DCR, DEQ, SWCD, VDH, NRCS
  - Counties: Henrico, Powhatan and Chesterfield
  - City of Richmond
  - Working Group Representatives
- **Meet**: 2 – 3 meetings during plan development
- **Responsibilities:**
  - Review contractor's results
  - Assess input from working groups
  - Address community concerns/suggestions
  - Help guide the process:
    - Are we getting "representative" input?
    - How can we do better?

Working Groups

- Include:
  - Agricultural
  - Residential
  - Urban/Government
- Meet:
  - 2 –3 times each
  - Starting November 2010

Agricultural Working Group

Responsibilities:

- Identify potential constraints to implementation
- Identify alternative funding sources/partnerships
- Review implementation strategies from an agricultural perspective
- Identify outreach methods for engaging agricultural producers

Residential Working Group

Responsibilities:

- Identify possible constraints to implementation
- Identify methods of outreach to homeowners with sewage problems
- Identify alternative funding sources/partnerships
- Review implementation strategies from a homeowner's perspective

Government/ Urban Working Group

Responsibilities:

- Identify funding sources
- Identify available technical resources
- Identify appropriate “measurable goals” and timeline for achievement
- Identify regulatory controls currently in place
- Identify potential parties to be responsible for agricultural, residential, and urban implementation
- Evaluate various corrective actions, costs, tracking procedures, and technical assistance needs

Steering Committee

Responsibilities:

- Direct overall process
- Review output from working groups
- Identify methods of public outreach
- Review future implementation

TMDL Implementation Plan Tentative Schedule

- Assessment of needs in progress

- 11/16 : Workgroup Formation Brainstorming session
- 12/27 : Comment Period For Preliminary Plan Development Ends, Send Comments to DEQ-PRO Office
- Dec 2010/Jan2011 : 1st Working Group Meetings
- Dec 2010/Jan2011 : Steering Committee Formation & 1st meeting
- Jan 2011/Feb 2011 : 2nd Working Group Meetings
- Jan 2011/Feb 2011 : 2nd Steering Committee Meeting
- Feb 2011/Mar 2011 : 3rd WG & Steering Committee Meeting (If Necessary)
- Apr 2011/May 2011 : Draft Plan for Public Review & 2nd Public Meeting
- June 2011/July 2011 : Draft Plan Finalized
- September 2011 : Draft Plan Submitted to SWCB For Approval

Contact Information

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